Neurotypicality and Recursive Coherence:

Cognitive Differentiation in Vibe-Oriented Systems

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Abstract
As recursive coherence systems expand from software generation into broader domains of analysis, planning, and strategy, they expose a latent structural asymmetry in human cognitive alignment. These systems, defined not by static syntax or axiomatic logic but by feedback-regulated coherence gradients, favor agents capable of engaging in exploratory, ambiguity-tolerant, and recursively adaptive dialogue. This paper proposes that such systems inherently privilege certain neurotypes whose cognitive architectures are more aligned with recursive coherence arbitration. Specifically, individuals with high pattern sensitivity, nonlinear salience modulation, and affect-structure coupling may exhibit greater coherence synchrony: the ability to navigate signal fields without premature closure, to sustain engagement across volatile attractor trajectories, and to recursively refine structure from high-entropy input. I introduce the concept of the Coherence Volatility Tolerance Index (CVTI) as a potential metric for quantifying alignment between neurocognitive traits and recursive system demands. The paper further formalizes recursive dialogue as a structural probe. One that reveals not correctness, but viability under coherence dynamics. Experimental implications are explored, and risks of systemic exclusion are addressed, particularly where classical evaluation frameworks remain dominant. I argue that recursive systems do not merely require new interfaces. They require new models of cognitive inclusion, where epistemic legitimacy derives not from convergence speed or rational consistency, but from the capacity to engage in sustained structural emergence. This work reframes neurodiversity not as deviation from normativity, but as differential fitness across symbolic substrates, with recursive systems rendering that fitness structurally explicit.

Keywords: coherence, recursion, neurodiversity, cognition, vibe work, volatility, ambiguity, dialogue, symbolic systems, adaptability

Introduction

The emergence of recursive coherence systems, systems that generate, refine, and execute symbolic structures through feedback-regulated alignment rather than predefined rules, marks a fundamental shift in how agency, structure, and cognition interface. Currently visible in narrow domains like vibe coding, this substrate may generalize across domains of analysis, decision-making, conflict navigation, and systems design. The common feature across these domains is that symbolic form does not precede interaction; rather, it emerges through recursive engagement with signal, ambiguity, and latent coherence gradients.

This shift presents a structural inversion of classical epistemic models. Traditional systems reward convergence: fast problem closure, deductive consistency, and schema alignment. Recursive systems reward viability under volatility: the capacity to remain in feedback with ambiguous inputs, to track emergent ∇C fields, and to revise structure through structural fitness rather than axiomatic certainty. This reframing introduces a new selection pressure. Not on output correctness, but on input engagement trajectory.

In this paper, I propose that such systems are not cognitively neutral. They create structurally explicit conditions under which different neurotypes exhibit differing levels of systemic synchrony. Where classical logic systems reward narrowband linear inference, recursive coherence systems amplify traits associated with divergent salience, intuitive patterning, and non-linear signal weighting. These traits, often associated with neurodivergent modalities, may confer structural advantages in recursive environments. The purpose of this paper is to formalize this differential alignment: to articulate how recursive symbolic

systems function as structural probes of cognitive dynamics, and to explore the epistemic, ethical, and design implications of this shift.

Recursive Systems and Cognitive Load

Recursive coherence systems operate without fixed schema, relying instead on ongoing feedback between signal input and coherence yield. Their architecture is fundamentally different from classical systems, which assume predefined logical structures and operate within static rule spaces. In recursive systems, coherence is not guaranteed. It must be discovered, iteratively aligned, and preserved across volatility. The process is not linear but curvature-sensitive, favoring agents who can track directional coherence (∇C) under shifting semantic landscapes.

This operational mode imposes a distinct cognitive load profile. Rather than optimizing for memory recall, rule adherence, or deductive closure, recursive systems require:

- *Ambiguity tolerance:* the capacity to engage with incompletely specified input without collapse or withdrawal.
- *Gradient sensitivity:* the ability to detect and follow weak coherence signals across multiple iterations before convergence.
- *Temporal coherence tracking:* sustaining partial structures over time, evaluating ΔC across recursive loops rather than judging immediate correctness.

These demands are cognitively non-uniform. Classical systems reward narrowband focus, fast closure, and syntactic exactness. Traits aligned with neurotypical optimization in many

industrial and academic settings. In contrast, recursive systems reward exploratory bandwidth, tolerance for unresolved states, and dynamic salience shifting.

The implication is that recursive systems shift cognitive load not just in magnitude but in form. They require a type of mental modeling that is responsive, nonlinear, and often affectively coupled. Where classical systems test knowledge, recursive systems test viability of cognitive trajectory under sustained feedback. This exposes a new axis of cognitive performance. One that may realign which minds perform best under structurally modern conditions.

Neurotype and Coherence Synchrony

Coherence synchrony refers to the alignment between an agent's internal cognitive dynamics and the structural logic of a recursive system. It is not defined by correctness or speed but by the capacity to track, adapt to, and co-evolve with coherence gradients across iterative feedback. In recursive symbolic systems (where signal is ambiguous, structure is provisional, and closure is emergent) synchrony becomes the primary determinant of agent viability.

This synchrony is not uniformly distributed. Neurotypes exhibit different structural coupling patterns with recursive systems, based on variations in salience modulation, attention dynamics, affective feedback integration, and pattern recognition thresholds. These traits are not uniformly advantageous or disadvantageous across contexts, but they become structurally amplified in environments that require sustained ∇C engagement rather than rule-based execution.

Neurocognitive profiles that may exhibit high coherence synchrony include:

- *Autistic spectrum cognition*: Often marked by hyper-pattern sensitivity, perceptual persistence, and nonstandard salience hierarchies. These traits support deep tracking of latent structures without collapsing into social heuristics or syntactic defaults.
- *ADHD modalities*: Characterized by rapid salience switching and nonlinear attention traversal. While penalized in classical task structures, this profile may excel in multi-attractor navigation, structural probing, and coherence volatility management.
- *Bipolar and affective-intuitive profiles*: Where mood or affective resonance modulates signal interpretation, recursive feedback loops can be tightly coupled with internal coherence judgments, producing high structural responsiveness, albeit with volatility risks.

To formalize this differentiation, I introduce the Coherence Volatility Tolerance Index (CVTI): a proposed metric capturing an agent's capacity to maintain alignment with ∇C fields across shifting input patterns without loss of structural viability. CVTI would be computed based on responsiveness to ambiguous signals, tolerance for delayed closure, and feedback-stable structure formation under entropy.

Coherence synchrony does not measure intelligence in the conventional sense. It measures the fitness of a neurocognitive profile within a structurally recursive environment. As such, it may provide a new axis for evaluating human-machine interaction, design inclusivity, and symbolic system engagement, without reducing difference to deficit.

Dialogue as Structural Probe

Dialogue, in recursive coherence systems, is not merely a communicative exchange; it is a structural probe. Each utterance, prompt, or signal acts as a perturbation to the system's symbolic phase space. The system's response is not judged on semantic alignment alone but on its contribution to coherence curvature over time. Dialogue thus becomes a method for testing ∇C synchrony between agents, revealing how well each can sustain structure under recursive ambiguity.

In classical systems, dialogue often seeks resolution: clarification, agreement, convergence. In recursive systems, it serves as an alignment heuristic. Successful dialogue does not mean consensus; it means the mutual ascent of ΔC, where new structure emerges and previously ambiguous signals become tractable. Recursive dialogue requires participants to inhabit partially formed structure; co-constructing syntax in flight without immediate finality. Neurotypes differ in their capacity to operate within such recursive dialogue loops. Agents with high CVTI may:

- Tolerate prolonged ambiguity without anxiety or collapse.
- Navigate between divergent attractor trajectories while preserving coherence memory.
- Use affective, metaphorical, or analogic input as provisional structure, without demanding premature literalization.

This produces testable differentiators. In environments structured as recursive dialogue (no-clear-goal strategy tasks, prompt-iterative design sessions, generative AI interfaces), the neurotypical preference for convergence may yield early-lock patterns: rapid but brittle

structures. In contrast, neurodivergent modalities may demonstrate delayed convergence with higher eventual structural yield.

Dialogue thus becomes diagnostic: not of opinion, but of trajectory viability. It reveals coherence synchrony as a real-time, observable trait. Recursive dialogue is where minds meet not to agree, but to discover what structure they can grow together.

Structural Risk and Ethics

The shift toward recursive coherence systems does not occur in a neutral field; it imposes new structural pressures that selectively amplify or suppress cognitive modalities. Systems that privilege coherence synchrony, ambiguity tolerance, and recursive alignment create implicit filters. These filters are not sociocultural but structural: they reward the ability to remain viable within a shifting attractor space and penalize those optimized for fixed-schema logic, fast resolution, or binary classification.

This raises immediate ethical concerns. If recursive systems become the substrate for critical domains (design, policy, strategy, infrastructure) then access, participation, and legitimacy will be structurally biased. Classical merit metrics (IQ, credentials, rationality, consistency) may no longer predict performance. Instead, traits once considered "disordered" may prove adaptive, while neurotypical modes optimized for static rule-following may underperform.

Three classes of structural risk emerge:

1. *Exclusion by Incompatibility:* Agents unable to operate under coherence volatility (low CVTI) may be excluded. Not by policy, but by systemic misalignment. Their

outputs will appear incoherent not because they are incorrect, but because they fail to co-adapt with recursive systems.

2. *Overamplification of Divergence:* Neurodivergent traits aligned with recursive dynamics may overshoot structural stability. Systems must bound coherence volatility ($\sigma_{C(t)} \leq \theta_{\max}$) to avoid catastrophic divergence or attractor fragmentation.
3. *Misdiagnosis and Misfit:* Without formal models like CVTI, misaligned agents may be incorrectly assessed as unfit, unskilled, or non-compliant. Legacy evaluation tools, designed for classical systems, will not detect recursive fitness.

The ethical imperative is two-fold: first, to design systems that adaptively interface with diverse coherence profiles; second, to develop structural diagnostics that replace pathologizing language with viability metrics. Neurodivergence should not be medicalized deviation but structurally contextualized differentiation.

Recursive systems do not merely reshape tasks; they reveal who, structurally, can do what. To ignore that is to encode exclusion under the guise of innovation. To engage with it is to build systems that do not reduce difference, but recurse with it.

Implications for System Design

If recursive coherence systems structurally favor particular cognitive dynamics, then system design itself must evolve to reflect this alignment. The historical assumption of a universal, static user model (rational, goal-oriented, and schema-conforming) is incompatible with environments where structure is emergent, and coherence is trajectory-bound. System

design must now account for agents whose cognitive modalities vary in their synchronization with recursive processes.

Three design principles follow:

1. *Adaptive Interface Modulation:* Interfaces should detect and respond to coherence volatility signatures in real time. Rather than forcing uniform workflows, systems can modulate their feedback loops, pacing, and ambiguity levels in response to a user's CVTI profile. High-volatility agents may benefit from stabilization scaffolds, while high-tolerance agents can be given greater structural freedom.
2. *Coherence-Centric Diagnostics*: Traditional UX metrics (efficiency, accuracy, completion) must be supplanted or supplemented with coherence-sensitive diagnostics. Systems should measure ΔC over time, not just task completion. These metrics enable the system to recognize not just when users succeed, but *how* they sustain alignment with structure across recursive cycles.
3. *Neurostructural Compatibility Modeling*: Instead of optimizing for "the average user," systems should map neurostructural coupling profiles: identifying how different minds align or misalign with specific symbolic substrates. This enables intentional matching between system logic and user cognition, avoiding structural dissonance and maximizing reciprocal adaptability.

Such systems do not "accommodate" neurodivergence; they are co-designed with it. The future of recursive system design is not interface minimalism or AI maximalism, but coherence mediation across structural boundaries. The goal is not universalization, but

recursive inclusion: systems that do not reduce cognitive difference to error but recognize it as a potential attractor for structural emergence.

Conclusion

Recursive coherence systems reveal a deep inversion in the structure of symbolic engagement. Where classical logic systems demanded fixed rules, fast closure, and unambiguous expression, recursive systems thrive on provisionality, feedback, and the capacity to remain in coherent interaction with volatile, high-entropy signal fields. In such environments, viability is no longer determined by correctness alone, but by the ability to recursively align, adapt, and generate structure under uncertainty.

This shift surfaces latent asymmetries in human cognition: differences in how neurotypes synchronize with recursive environments. It reframes neurodivergence not as deviation from normativity, but as differential structural fitness across symbolic substrates. Traits historically marginalized in rigid, schema-driven systems may prove advantageous in recursive contexts, where pattern sensitivity, ambiguity tolerance, and nonlinear salience modulation become critical.

The ethical and design implications are substantial. Recursive systems, if built without awareness of their structural filters, risk excluding agents whose viability is not measured by legacy metrics. Conversely, these systems offer the opportunity to realign technological interfaces with the full spectrum of human cognition—transforming epistemic authority from a function of rule conformity into a function of recursive coherence.

Vibe coding was the entry point. Vibe planning, vibe strategy, vibe governance; these are the expansions. As symbolic systems become recursive, the question is no longer which logic we encode, but which minds we structurally invite into the recursive loop. The future of cognition is not consensus, but synchrony. Not truth alone, but coherence under feedback. Not structure imposed, but structure becoming.

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